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Notes on Preventive Medicine for Medical Officers, United States Navy.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., May 10, 1918.

NOTES ON THE EPIDEMIOLOGY OF DIPHTHERIA.

The epidemiology of diphtheria is better understood, perhaps, than that of any other acute communicable disease of the respiratory type. Probably local and State boards of health have had more practical experience in its suppression than that of any other disease because of its wide prevalence, because the principal facts in its etiology have been well known for many years, and the comparative simplicity of its bacteriological technique has made possible in almost all communities the scientific application of measures for its prevention and control.

It is well known that diphtheria is frequently spread by healthy carriers as well as by persons ill with the disease. Much work has been done to determine the incidence of carriers, both in the presence of epidemics and at times when the disease has not been generally prevalent. The percentage of carriers found among actual contacts varies from 10 per cent, where precautions are taken to isolate the cases, to 50 per cent, or even 100 per cent, where no precautions are taken. Rosenau states that 1 per cent of 4,500 school children in Boston at the beginning of the school year when the disease was not prevailing were carriers of morphologically typical diphtheria bacilli. Among 4,098 healthy individuals in Detroit shortly after a time of greatly increased prevalence of the disease, Goldberger found 38 or 0.9 per cent to be carriers of morphologically typical diphtheria bacilli. Of these, however, only 0.097 per cent were virulent. His figures are low, perhaps, in comparison with those of other observers who have found between 2 and 5 per cent under similar conditions to be carriers of diphtheria organisms, with virulent bacilli in 0.1 per cent to nearly 2 per cent of the cases.

Cold weather, density of population, overcrowding, prevalence of tonsillitis and acute catarrhal infections of the upper respiratory tract are all factors which greatly increase the percentage of carriers who may be found. They also tend to increase the incidence of the disease.

Investigations have shown repeatedly that only a small percentage of the carriers detected harbor virulent organisms. The percentage will necessarily vary, depending upon whether the disease is epidemic, or merely sporadic in the community, and upon whether the carriers have actually been in contact with a case of diphtheria. Unless these facts are recognized and given consideration it is possible to interfere seriously with naval routine and important naval activities by isolating great numbers of carriers who harbor nonvirulent organisms incapable of causing diphtheria.

Virulency can not be determined with certainty without a guinea-pig test and therefore in the Navy under war conditions it will ordinarily be permissible to limit the isolation of carriers to those who have been in intimate contact with a known case of diphtheria. This

brings us to the difficult question, Who is a contact? If there is a contaminated drinking cup involved, the intimate contact may be a man far removed in another part of the ship or station. In many instances the problem is easier to solve in barracks than on board ship. Ordinarily, suspicion will naturally fall on the occupants of the room or compartment from which a case is taken, and particularly on those occupying adjacent bunks or hammocks, but it must be remembered that the transference of nose and throat secretions, directly or indirectly, is quite as likely to have occurred at mess or among those working together as under sleeping conditions. The possibilities are infinite and the question naturally must be left to the judgment of the individual medical officer.

Theoretically diphtheria can be controlled readily, but it is not always practicable under service conditions to apply at once or at the same time the several measures of proven efficacy. At training stations the problem is simpler than on board ship. Ordinarily there is less overcrowding, and in spite of the greater numbers there is more natural separation of men into groups occupying a relatively greater amount of territory. If the necessity arises it is possible to segregate individual units at once and to inspect the entire personnel promptly without interfering seriously with the routine work of the station. Moreover, the Medical Department of a training station has reason to be prepared constantly to prevent the introduction of any communicable disease and antidiphtheria work is, or should be, a part of the daily routine of the laboratory.

In the so-called receiving ships as they exist to-day the problem of controlling diphtheria presents many difficulties, because of essential naval activities and intrinsic conditions of war. Men are being received and men are being transferred daily. It is difficult to separate them into well-defined groups, and facilities for isolating men who have been exposed to diphtheria are generally poor. To be sure, there is no reason why the resources of a bacteriological laboratory should not be available, but frequently it is difficult to hold men under sufficiently careful observation or for a long enough period to make as effective as they would be under ordinary circumstances such well-recognized measures as daily inspection, nose and throat cultures, use of antitoxin, the Schick test, and immunization with a toxin-antitoxin mixture. Educational measures are always applicable, and all measures can be applied at any time if the gravity of the situation demands. The necessity for the institution of effective medical measures must always be weighed against military necessity. Location of the receiving ship in a modern cantonment does much to facilitate the control of diphtheria, as well as other communicable diseases.

On board cruising ships laboratory work is more difficult or perhaps impossible on a large scale without outside assistance, but close observation of the personnel, early detection and isolation of cases, use of antitoxin, application of the Schick test, and administration of the toxin-antitoxin mixture, if the materials are at hand, can be carried out ordinarily with greater ease than at a receiving ship. Here again, the extent to which preventive measures are enforced will depend upon the gravity of the situation as compared with military necessity under war conditions. Unfortunately, sometimes it is a question as to which will interfere most with the duties assigned to the ship, the disease itself or the immediate application of measures necessary to eradicate the disease. Obviously the circumstances under which a case of diphtheria appears vary. The occurrence of a case when the personnel has had no contact with communities ashore other than through ordinary routine and liberty will not excite as much apprehension as the appearance of a case shortly after the arrival on board of a draft from a receiving ship where the disease is known to be prevalent. The appearance of subsequent cases will indicate the necessity for the wider application of active preventive measures.

A case of diphtheria should be isolated promptly and early. Antitoxin in therapeutic doses should be administered immediately on definite clinical appearances without waiting for bacteriological confirmation. It is justifiable to administer prophylactic doses of antitoxin at once to any of the personnel who show suspicious symptoms and signs in the throat, if cultures can not be made at once. Ordinarily, antitoxin should not be given to perfectly healthy individuals, but the situation may be sufficiently serious to justify prophylactic doses to all contacts as a temporary expedient. Under conditions of overcrowding, particularly if acute tonsillitis and catarrhal affections of the upper respiratory passages are prevalent, the flora of the nose and throat tends to become uniform throughout the personnel, and with diphtheria present on board it is quite likely that a high percentage of contacts will harbor virulent diphtheria bacilli. It has been found by the Schick test that nearly 50 per cent of young adults are susceptible to diphtheria. These conditions and the severity of the outbreak will guide one in the use of antitoxin, but it must be remembered that it is impossible to eradicate diphtheria if reliance is placed on antitoxin, because the immunity conferred by it is of brief duration, lasting perhaps not more than a week. Antitoxin has no influence on the carrier state.

Death due to anaphylaxis following the use of antitoxin is extremely rare, and in so far as known this accident has occurred only in connection with a first dose of antitoxin. While the danger is remote it is well to make inquiry always for evidence of sensitization, such as "horse asthma." Desensitization is practicable.

As soon as a case of diphtheria has been discovered and isolated the entire crew, or as many members thereof as may be deemed necessary, should be inspected at once for suspicious symptoms or signs indicative of clinical diphtheria. At this time contacts should be selected and cultures should be taken if possible. The place or compartment from which the case was taken should be cleansed and mopped down with a liquid disinfectant. All bedding should be sunned and aired, together with the personal effects of the patient. Concurrent disinfection should be practiced. This means disinfection of the discharges of the patient and of articles soiled by him, including those contaminated before his transfer to the isolation ward.

Educational measures should be instituted. The crew should be taught by bulletins and by verbal instructions the nature of the disease and its mode of onset. The manner in which it is transmitted should be explained and the men should be cautioned against promiscuous coughing, spitting, and sneezing. They should be warned of the danger of swapping pipes, Bull Durham bags, and other articles likely to have been in the mouth. The rôle of a common drinking utensil should be emphasized. Careful supervision of scuttle butts should be maintained and the medical officer should assure himself that mess gear is being properly sterilized.

Chief petty officers and petty officers should be encouraged to send to the sick bay for immediate examination all men who complain of feeling ill. The entire crew should be kept under rather close observation. It may be necessary to take cultures from or to examine daily with care only those men who belong to the division or group in which the case or cases occurred. The disease, for example, may be limited to the fireroom force. The whole ship's company should be kept in the open air as much as possible

Inspection of the entire crew may be necessary in order to detect men with sore throats who will not voluntarily present themselves for examination.

In civil practice during an epidemic of diphtheria the culturing of contacts, both in the home and in the school, is one of the most important measures which can be undertaken for the suppression of the disease. The isolation of carriers in the home and exclusion of carriers from schools is a comparatively simple procedure to enforce, because in either case there need be no particular interference with the daily work other than that of small and separated family units. As a rule no attempt is made to differentiate between virulent and nonvirulent organisms by scientific tests. A child detected as a carrier of a morphologically typical diphtheria bacillus is sent home for isolation. Closure of the school on account of diphtheria generally indicates ignorance or helplessness on the part of the city authorities. In the Navy, however, the problem is not so simple. The importance of isolating carriers must be admitted but the isolation of a number equal to that which would present no great difficulty in civil practice, might seriously interfere with naval activities. On the other hand, carriers of virulent organisms at large among the naval personnel are capable of interfering with the control of the disease, unless the personnel is immunized and kept immune.

Combined nose and throat cultures should be made as soon as possible to confirm clinical diagnoses of diphtheria and to detect carriers. The nose culture is very important in the

detection of healthy carriers. Ordinarily, the search for carriers may be limited to contacts or to the group of men from which the case was taken. Under good conditions on board ship it is probable that not more than 1 or 2 in 10 of the carriers detected by cultures alone will harbor virulent bacilli. An attempt to isolate all of the carriers who may be detected by wholesale culturing may possibly interfere seriously with the routine and movements of the ship when, if the truth were known, the carriers may not be sufficiently dangerous to warrant such a procedure. It is logical, however, to assume that a high percentage of dangerous carriers will be found among intimate contacts of the case. These should be isolated until three consecutive negative cultures, taken 24 hours apart, have been obtained. Antiseptic nose and throat sprays may be of some value; not that they sterilize the nasopharynx, but because they serve mechanically to wash out the cavities and dilute the secretions, thereby tending to lessen the incidence of cross infections among carriers while in isolation.

Attendants may be protected by the use of gauze masks. Carriers should be watched closely for the development of clinical diphtheria. Convalescent patients should not be discharged until three consecutive negative cultures have been obtained, as in the case of carriers.

In the presence of an outbreak of diphtheria it is advisable to detect those men in the crew who are susceptible to the disease. The Schick test is satisfactory for this purpose and it is the only practical test by which immunity and susceptibility can be determined. Work done at the Naval Training Station, Great Lakes, Ill., during the past few months seems to show that individual immunity varies from time to time and that the Schick reaction is of value only at the time the test is made. Other observers have likewise concluded that the Schick test is chiefly of value during an outbreak of the disease. Therefore, it is not considered advisable to apply the test as a routine measure at the time of enlistment or transfer. In applying the Schick test a control test should always be made with toxin which has been heated to 100° C. for one hour. The materials for the Schick test, being neither curative nor preventive, do not come within the law covering products which can be sold only under a United States Government license.

The dose is 1/50 M. L. D. of stable toxin in 0.1 cc. of salt solution for intracutaneous injection. If the skin at the site of the injection remains normal the reaction is negative, indicating that the individual has sufficient antitoxin in his blood to neutralize the toxin. Such persons are presumably immune to diphtheria. However, there came under the observation of the workers at Great Lakes an instance where diphtheria with a positive throat culture developed, during an instutional outbreak in a near-by town, seven days after a negative Schick test and negative culture had been obtained. In positive reactions a faint redness appears at the site of injection in about 12 to 24 hours, increases in intensity up to the third or fourth day, and disappears gradually thereafter, leaving a circumscribed scaling area with brownish pigmentation. A pseudo reaction appears earlier than the positive reaction. It is urticarial in nature and disappears sooner. It shows no scaling and little or no pigmentation. The site of the control should also show a pseudo reaction.

When cases of diphtheria are likely to appear from time to time, especially under circumstances where it is difficult or impossible to isolate carriers, immunization of nonimmunes with a toxin-antitoxin mixture is a valuable aid in preventing the introduction of the disease, and in limiting the number of secondary cases. Immunity is acquired slowly. Fortunately, the more susceptible individuals seem to develop resistance with sufficient rapidity to make the procedure useful, particularly in institutions for the care of children. Toxin-antitoxin immunization is not entirely out of the experimental stage. The number of injections and the intervals between them which will afford the greatest amount of protection have not yet been determined. Parke, Davis & Co. and the department of health of the city of New York are licensed by the Treasury Department (United States Public Health Service) to manufacture toxin-antitoxin mixtures for sale in interstate commerce. Both are now labelling their products to indicate dosage and the toxin-antitoxin content. The immunizing power is about the same for both preparations. Each cc. of the Parke, Davis product contains 5 L+ doses of toxin combined with 6.25 units of antitoxin, while that of the New York department of health contains 2.85 L+ doses of toxin combined with 3.28 units of antitoxin.

The dose of either preparation is 1 cc., injected subcutaneously over the insertion of the deltoid. Ordinarily, three injections are given at weekly intervals. More than three injections are not recommended unless a positive Schick test is obtained three months later, when another series of inoculations may be made. This appears to be necessary in about 10 per cent of the

cases, as about 90 per cent have been found to give negative Schick reactions after three months. Investigations carried on at Great Lakes showed that of the group of men who gave the strongest positive reaction to an initial Schick test (+ + + +)—the most susceptible individuals—100 per cent acquired partial immunity in periods of 35, 75, and 102 days. The group which gave the weakest positive reaction to an initial Schick test—indicating the possession of some natural immunity—contained the least number of men to develop additional immunity. The men in both groups received only two injections each of the toxin-antitoxin mixture.

The reactions following injections of toxin-antitoxin are ordinarily trivial, but both local and general reactions do occur. In the work done at Great Lakes, in a series of 2,073 men who received two injections, and 484 who received but one injection, 5 per cent gave general and 10 per cent local reactions. The general reaction was that of a typical mild serum sickness with a temperature of 100° to 102° and a chill. The more marked cases required two or three days of hospital treatment. In a few instances urticarial rashes occurred immediately after the injection, disappearing within 24 hours. The local reaction was usually most severe in men who had no general reaction, and consisted of swelling of the arm with hyperemia, occasionally extending downward to the wrist. Hyperemia seldom extended more than 2 inches above the site of injection. The local reactions caused no trouble other than inconvenience and pain, which interfered with drill for from one to three days in some instances.

The present status of toxin-antitoxin immunity hardly warrants its use as a routine measure at the time of enlistment or transfer of men.

In making an epidemiological study of diphtheria it must be borne in mind that infected milk and ice cream are at times responsible for an outbreak of the disease. When disseminated by infected milk the disease is generally severe in type, the outbreak fulminating in character, and primary cases are limited to the consumers of raw milk.

INSTRUCTIONS RELATIVE TO TRANSPORTATION OF THE DEAD.

The attention of all medical officers is hereby directed to Bureau Circular Letter No. 129504, of February 15, 1918, subject, "Embalming, care, and disposition of the dead" (Army and Navy), the provisions of which must be strictly complied with.

The bureau continues to receive letters from relatives complaining of the condition in which bodies are received. Apparently the circular letter has not yet reached all medical officers, as it is evident from the numerous complaints that former arrangements with undertakers and previous practices in vogue at some hospitals and stations are still being followed. Undertakers must be instructed to comply with the requirements. The details of carrying out instructions are left to the medical officer supervising the preparation of the remains.

Attention is invited particularly to paragraphs 5 and 12 of the letter. The medical officer responsible for the preparation of the remains shall, in compliance with paragraph 12, see that the body is fully clothed in proper uniform and then the required wrappings of cotton wadding and a sheet shall be applied over the uniforms. In every instance the medical officer shall, prior to shipment, inform the relatives of the deceased by letter of the reason for the additional coverings.

Medical officers are invited to submit to the bureau any suggestions that they believe may be useful in extending the scope of this bulletin to render it of greater value. Questions in the field of preventive medicine will be welcomed and will be answered in accordance with the best available authority.

Criticism of anything contained in the body of the bulletin or in any of the statistical tables will be appreciated. In referring to any article appearing in a bulletin, reference should be made to the letters and numbers in the upper right-hand corner, as well as to the serial number.

The following statistics are furnished for the information of medical officers:

The annual rates shown in the tables are obtained in the following way: The figure representing the total original admissions to the sick list or the number of deaths reported during the week is multiplied by 1,000 and divided by the complement. The quotient is then multi-

plied by 52. As weekly figures always fluctuate widely, *caution must be used in interpreting annual rates calculated on a weekly basis.* In the following tables it may be taken for granted, where no figures appear, that the disease did not occur, or, if in reference to hospitals, that no case was admitted.

W. C. Braisted.

Table 1.—ADMISSIONS TO SICK LIST AND ANNUAL ADMISSION RATES, TRAINING STATIONS AND CAMPS, WEEK ENDED MAY 4, 1918.

Total strength, men at training stations and camps	112,968
Total admissions, all causes	1,602
Admission rate per thousand, all causes	737.36
Average rate per thousand, all causes, since Jan. 1, 1918	1,173.95
Total admissions for venereal diseases	168
Total admission rate per thousand, venereal diseases	76.96
Average rate per thousand, venereal diseases, since Jan. 1, 1918	97.70

Stations.	Total admission, all causes.	Annual rate.	Average rate since Jan. 1, 1918.	Total admissions, venereal.	Annual rate.	Average rate since Jan. 1, 1918.	Complement.
Great Lakes Training Station	252	653.64	1,171.56	39	95.68	90.24	20,047
Naval Base Station (Hampton Roads)	34	367.64	1,332.06	7	75.40	70.19	4,809
Newport Training Station	144	984.36	1,043.72	8	54.60	71.26	7,603
San Francisco Training Station	48	756.60	1,505.40	5	78.52	105.62	3,297
Bumkin Island, Boston	14	1,004.12	1,831.31	.....	.....	76.26	725
Charleston, S. C.	33	642.20	1,330.30	1	19.24	97.32	2,671
Hingham, Mass.	40	2,280.20	1,768.11	.....	.....	70.89	912
Key West, Fla.	16	632.84	1,060.59	3	118.56	108.44	1,314
Mare Island, Cal.	45	1,139.84	1,771.35	7	177.84	126.78	2,052
Naval Training Camp (San Pedro, Cal.)	12	510.64	837.98	.....	.....	118.04	1,221
Naval Training Camp (Seattle, Wash.)	9	583.44	499.52	2	129.48	61.68	802
New Orleans, La.	29	1,066.00	1,322.64	6	220.48	147.30	1,414
Pelham Park, New York	41	431.08	633.50	5	52.52	39.14	4,943
Pensacola, Fla.	95	2,102.88	1,644.00	6	132.60	157.15	2,349
San Diego, Cal.	107	1,750.32	2,326.56	6	97.76	84.93	3,178
Receiving Ship, Boston (Commonwealth Pier)	21	491.40	887.89	4	93.60	145.56	2,222
Receiving Ship, New York (including Ellis Island)	86	718.64	1,126.98	3	24.96	131.64	6,219
Receiving Ship, Norfolk (including St. Helena)	63	486.20	1,020.03	6	46.28	135.40	6,731
Receiving Ship, Philadelphia, Pa.	54	510.12	800.50	12	113.36	193.26	5,502
Receiving Ship, including Training Camp (Puget Sound, Wash.)	21	726.44	775.25	8	276.64	149.98	1,503
Marine Barracks, Parris Island, S. C.	126	932.88	1,227.97	5	36.92	59.28	7,023
Marine Barracks, Quantico, Va.	43	620.88	969.28	3	43.31	80.11	3,600
Navy Yard, including Marine Barracks (Puget Sound, Wash.)	9	4,414.80	928.75	.....	.....	48.06	106
Wissahickon Barracks, Cape May, N. J.	45	1,335.36	1,574.35	3	88.92	89.98	1,752
Submarine Base, New London, Conn.	25	819.00	1,224.05	2	65.52	103.60	1,587
Submarine Base, San Pedro, Cal.	16	1,033.24	1,140.85	2	128.96	92.96	805
Dunwoody Industrial Institute (Minneapolis)	19	1,274.52	836.62	2	134.16	102.75	775
Naval Radio School, Harvard University	61	755.04	903.96	3	36.92	76.20	4,200
Newport, R. I., Section (Cloyne Field)	16	489.32	1,764.64	1	30.16	42.99	1,700
Section No. 6, Third Naval District (Bensonhurst)	11	690.56	1,288.73	.....	.....	57.02	828
Section Base, Cape May, N. J.	9	553.80	930.54	1	61.36	33.06	845
Section Base, New London, Conn.	15	222.56	481.93	.....	.....	38.32	3,500
Miami Air Station, Fla.	6	275.08	372.75	1	45.76	29.12	1,133
Armed Draft Detail, New York	37	343.20	422.87	19	176.28	163.15	5,600

TABLE 2.—ADMISSION BY DISEASES, AND ANNUAL RATE PER 1,000, WEEK ENDED MAY 4, 1918.

Diseases.	Great Lakes Training Station (20,047).		Naval Base Station, Hampton Roads (4,809).		Newport Training Station (7,603).		San Francisco Training Station (3,297).		Receiving Ship, Norfolk, including St. Helena (6,731).	
	Number of cases.	Annual rate per 1,000.	Number of cases.	Annual rate per 1,000.	Number of cases.	Annual rate per 1,000.	Number of cases.	Annual rate per 1,000.	Number of cases.	Annual rate per 1,000.
Cerebrospinal fever					2	13.52				
Diphtheria	4	9.88								
Malaria			1	10.40	2	13.52	1	15.60		
German measles	4	9.88			2	13.52	3	47.32	1	7.28
Measles	14	35.88	1	10.40	9	61.36			8	61.36
Mumps	7	17.68	5	53.56	18	122.72	2	31.20	2	15.08
Pneumonia	4	9.88			5	33.80				
Scarlet fever	7	17.68					2	31.20		
Chancroid	3	7.28			1	6.76			1	7.28
Gonococcus infection	34	87.88	5	53.56	7	47.84	5	78.52	5	38.48
Syphilis	2	4.68	2	21.32						

Diseases.	Bumkin Island, Boston (725).		Charleston, S. C. (2,671).		Hingham, Mass. (912).		Key West, Fla. (1,314).		Mare Island, Cal. (2,052).	
	Number of cases.	Annual rate per 1,000.	Number of cases.	Annual rate per 1,000.	Number of cases.	Annual rate per 1,000.	Number of cases.	Annual rate per 1,000.	Number of cases.	Annual rate per 1,000.
German measles			1	19.24	1	56.68			1	24.96
Measles			1	19.24					1	24.96
Mumps	1	71.24	1	19.24					1	24.96
Gonococcus infection			1	19.24			3	118.56	7	177.32

Diseases.	Naval Training Camp, San Pedro, Cal. (1,221).		Naval Training Camp, Seattle, Wash. (802).		New Orleans, La. (1,414).		Pelham Park, N. Y. (4,943).		Pensacola, Fla. (2,349).	
	Number of cases.	Annual rate per 1,000.	Number of cases.	Annual rate per 1,000.	Number of cases.	Annual rate per 1,000.	Number of cases.	Annual rate per 1,000.	Number of cases.	Annual rate per 1,000.
Malaria					3	110.24				
German measles			3	194.48			3	31.20		
Measles	2	84.76			1	36.40				
Mumps					1	36.40	1	10.40	2	44.26
Pneumonia							1	10.40		
Scarlet fever							1	10.40		
Chancroid					1	36.40				
Gonococcus infection			2	129.48	5	183.56	5	52.52	5	110.24
Syphilis									1	21.84

Diseases.	San Diego, Cal. (3,178).		Receiving Ship, Boston, Commonwealth Pier (2,222).		Receiving Ship, New York, including Ellis Island (6,219).		Receiving Ship, Philadelphia, Pa. (5,502).		Receiving Ship, including Training Camp, Puget Sound, Wash. (1,503).	
	Number of cases.	Annual rate per 1,000.	Number of cases.	Annual rate per 1,000.	Number of cases.	Annual rate per 1,000.	Number of cases.	Annual rate per 1,000.	Number of cases.	Annual rate per 1,000.
Diphtheria					5	41.60				
Malaria							1	9.36		
German measles									1	34.32
Measles	2	32.24			2	16.64	2	18.72	1	34.32
Mumps	7	114.40	2	46.80	1	8.32			1	34.32
Pneumonia	1	16.12			1	8.32	2	18.72		
Scarlet fever					3	24.96	1	9.36		
Chancroid					2	16.64	4	37.44		
Gonococcus infection	6	97.76	4	93.60	1	8.32	6	56.68	5	172.64
Syphilis							2	18.72	3	103.48

TABLE 2.—ADMISSION BY DISEASES, AND ANNUAL RATE PER 1,000, WEEK ENDED MAY 4, 1918—Continued.

Diseases.	Marine Barracks, Paris Island, S. C. (7,023).		Marine Barracks, Quantico, Va. (3,600).		Navy Yard, including Marine Barracks, Puget Sound, Wash. (106).		Wissahickon Barracks, Cape May, N. J. (1,752).		Submarine Base, New London, Conn. (1,587).	
	Number of cases.	Annual rate per 1,000.	Number of cases.	Annual rate per 1,000.	Number of cases.	Annual rate per 1,000.	Number of cases.	Annual rate per 1,000.	Number of cases.	Annual rate per 1,000.
German measles	2	14.56								
Measles	3	21.84					6	177.84	3	94.64
Mumps	7	51.48	10	144.04	1	490.36				
Gonococcus infection	5	36.92	1	14.40			3	88.92	2	65.52
Syphilis			2	28.80						

Diseases.	Submarine Base, San Pedro, Cal. (805).		Dunwoody Industrial Institute, Minneapolis (775).		Naval Radio School, Harvard University (4,200).		Newport, R. I., Section, Cloyne Field (1,700).		Section No. 6, Third Naval District, Bensonhurst (828).	
	Number of cases.	Annual rate per 1,000.	Number of cases.	Annual rate per 1,000.	Number of cases.	Annual rate per 1,000.	Number of cases.	Annual rate per 1,000.	Number of cases.	Annual rate per 1,000.
Cerebrospinal fever			1	67.08			1	30.16		
Diphtheria			1	67.08	1	11.96				
Mumps					3	36.92				
Pneumonia					1	11.96				
Scarlet fever			1	67.08						
Gonococcus infection	1	64.48	2	134.16	3	36.92				
Syphilis	1	64.48					1	30.16		

Diseases.	Section Base, Cape May, N. J. (845).		Section Base, New London, Conn. (3,500).		Miami Air Station, Fla. (1,133).		Armed Draft Detail, New York (5,600).	
	Number of cases.	Annual rate per 1,000.	Number of cases.	Annual rate per 1,000.	Number of cases.	Annual rate per 1,000.	Number of cases.	Annual rate per 1,000.
Mumps			2	29.64	1	45.76		
Pneumonia							1	8.84
Scarlet fever							1	8.84
Chancroid					1	45.76		
Gonococcus infection	1	61.36					17	157.56
Syphilis							2	18.20

TABLE 3.—SUMMARY OF REPORTS FROM NAVAL HOSPITALS AND SICK QUARTERS, WEEK ENDED APR. 27, 1918.

Hospitals.	Cerebrospinal fever.		Diphtheria.		Malaria.		German measles.		Measles.	
	Under treatment.	Admitted.	Under treatment.	Admitted.	Under treatment.	Admitted.	Under treatment.	Admitted.	Under treatment.	Admitted.
Annapolis							2	2		
Cape May	1				1				4	4
Charleston					5		2		10	
Chelsea	6		37	6	1		4	2	8	2
Great Lakes	36	1	5	4	1	1	1	1	14	7
Gulfport										
Hampton Roads	6		2		4	2			6	1
League Island									1	
Mare Island	4				2				16	8
New London							2		7	2
Newport	17						6	1	24	9
New York	3	1	129	27			3	1	18	5
Norfolk	22	1	26	2	4	3			11	1
New Orleans			2		16	7	1	1	2	
Paris Island	3				1					
Pelham Park			1				5	2	1	
Pensacola	1	1								
Philadelphia			15	1					1	1
Portsmouth	2		38	10			1	1		
Puget Sound									3	2
Quantico	3				1	1	3	2	2	1
San Diego	2								1	1
Washington			4						1	
Total	106	4	259	50	36	14	30	13	130	44

Hospitals.	Mumps.		Pneumonia.		Scarlet fever.		All causes.		
	Under treatment.	Admitted.	Under treatment.	Admitted.	Under treatment.	Admitted.	Under treatment.	Admitted.	Discharged.
Annapolis	24	2	5		5	2	120	56	55
Cape May	1		10	2	4	1	65	18	20
Charleston	8		4				222	49	69
Chelsea	24	4	36	5	15	2	704	126	182
Great Lakes	24	4	181	18	51	10	791	154	147
Gulfport							26	29	3
Hampton Roads	23	4	30	2	16		240	40	70
League Island			23	2			112	17	50
Mare Island	37	21	14	2	4		324	62	77
New London	2	2	5		11	2	110	38	19
Newport	22	10	41	7	3	2	659	200	168
New York	38	6	92	10	52	11	1,843	443	415
Norfolk	102	6	66	5	20		1,327	241	360
New Orleans	4		1	1			139	120	53
Paris Island	1		2	1			73	25	30
Pelham Park	5	5	17	3	4		105	30	17
Pensacola	8		2	1			77	30	25
Philadelphia	15	6	16	4	13		348	92	98
Portsmouth	11	6	11	2			222	145	153
Puget Sound	3	1	3	1			102	28	32
Quantico	20	2			2	1	92	26	29
San Diego	20	7	9	3	9		175	128	230
Washington	1				1	1	142	30	26
Total	393	86	568	69	210	32	6,018	2,127	2,328

TABLE 4.—NUMBER OF ADMISSIONS AND ANNUAL RATES, ENTIRE NAVY, WEEK ENDED APR. 27, 1918.

[Rates based on an estimated complement of 36 ,000.]

Class.	Number of admissions.	Annual rate per 1,000.	Class.	Number of admissions.	Annual rate per 1,000.
Diseases of blood	2	.....	Diseases of nervous system	43	.....
Diseases of circulatory system	57	.....	Diseases of respiratory system	436	61. 88
Diseases of digestive system	703	.....	Diseases of skin, hair, and nails	49	.....
Diseases of ductless glands and spleen	2	.....	Hernia	49	.....
Diseases of ear	76	.....	Miscellaneous diseases and conditions	247	.....
Diseases of eye and adnexa	58	.....	Parasites (fungi and certain animal parasites)	53	.....
Diseases of genito-urinary system (non-venereal)	124	.....	Tumors	6	.....
Diseases of infective type (nonvenereal)	2, 029	288. 60	Injuries	332	.....
Diseases of infective type (venereal)	768	109. 20	Poisons	14	.....
Diseases of lymphatic system	30	.....			
Diseases of mind	38	.....	Total	5, 198	740. 48
Diseases of motor system	82	.....			

Chancroid infection	189
Gonococcus infection	487
Syphilis	92

TABLE 5.—DEATHS REPORTED, ENTIRE NAVY, WEEK ENDED MAY 4, 1918.

[Rates based on an estimated complement of 365,000.]

Cerebrospinal fever	3	Drowning	2
Meningitis, cerebrospinal	3	Other accidents and injuries	8
Diphtheria	4		
Pneumonia, lobar	23	Total	56
Pneumonia, broncho	2		
Tuberculosis, acute pulmonary	1	Annual death rate per 1,000, all causes	7. 9
Syphilis	1	Annual death rate per 1,000, diseases only	6. 5
Other diseases	9		

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